

What is claimed is:

1. A turbulence-free ventilated workstation comprising:

a) a work chamber having an access opening into the work chamber, the access opening having an upper edge;

5 b) a horizontal air deflector plate adjacent the upper edge of the access opening to divert a portion of air entering the access opening upwardly within the chamber, whereby said diverted air eliminates an airflow eddy current.

2. The ventilated workstation of claim 1, wherein said air deflector is an inverted airfoil that is positioned horizontally and extends rearwardly at an upward
10 angle of approximately forty-five degrees from horizontal.

3. The ventilated workstation of claim 1, wherein said air deflector is a box shaped air deflector extending upwardly and rearwardly.

4. The ventilated workstation of claim 1, wherein said air deflector plate has a first curve extending upwardly and rearwardly extending at an angle of approximately
15 forty-five degrees above horizontal to join a second curve extending rearwardly and downwardly back towards horizontal.

5. The ventilated workstation of claim 4, wherein said plate further includes slotted openings spaced at intervals of approximately one-third and two-thirds the length of the plate.

20 6. The ventilated workstation of claim 1, wherein said air deflector is an extended box shaped baffle having a lower section that extends upwardly and

rearwardly inside said work chamber at an angle of approximately forty-five degrees and a horizontal section that is positioned near the top of said workstation.

7. The extended box shaped baffle of claim 6, further including slotted openings spaced at intervals of approximately one-third and two-thirds the length of the baffle.

8. The ventilated workstation of claim 1, further including a sash door for adjusting the size of said access opening.

9. A turbulence-free ventilated workstation comprising:

a) a work chamber having an access opening into the work chamber, the access opening having an upper edge;

b) a plurality of vertically spaced airfoils including an upper airfoil and a lower airfoil, said airfoils being positioned along and spaced below the upper edge of the access opening to divert a portion of the air entering the access opening upwardly within the chamber, whereby said diverted air eliminates an airflow eddy current.

10. The ventilated workstation of claim 9, wherein each of said vertically spaced airfoils have an upwardly angled inner section with the angle of each inner section decreasing from the upper airfoil to the lower airfoil.

11. The ventilated workstation of claim 9, wherein each of said vertically spaced airfoils have a front end, said front end of each airfoil being aligned in the plane of said access opening.

12. The ventilated workstation of claim 9, wherein each of said vertically spaced airfoils have a back end, said back end of each airfoil being aligned within a plane parallel and rearwardly offset from the plane of the access opening.

13. A method of designing a turbulence-free laboratory safety enclosure
5 comprising the steps of:
a) defining a computational model that numerically represents the structure of a laboratory safety enclosure including a computational model that numerically represents the structure of an air deflector used to reduce turbulent air flow within the laboratory safety enclosure, said computational models being inputs into
10 computational resources usable to solve a set of computational fluid dynamics equations;

b) solving said set of computational fluid dynamics equations to determine an approximation of fluid dynamics within the laboratory safety enclosure;

c) displaying a representation of said approximation of fluid dynamics within
15 the laboratory safety enclosure; and

d) adjusting said computational model that numerically represents the structure of the air deflector to further reduce turbulence represented by the display of said fluid dynamics approximation.

14. The method of claim 13, wherein said set of computational fluid dynamics
20 equations are derived by applying the principles of conservation of mass, momentum and energy to a control volume of fluid.

15. The method of claim 13, wherein said computational models is automatically generated by software from computer-aided-drafting drawings.

16. The method of claim 13, wherein said adjusting said computational model includes editing computer-aided-drafting drawings used to generate said
5 computational models.

17. A method of designing a turbulence-free laboratory safety enclosure comprising the steps of:

a) defining a computational model that numerically represents the structure of a laboratory safety enclosure including a computational model that numerically
10 represents the structure of an air deflector used to reduce turbulent air flow within the laboratory safety enclosure, said computational models being inputs into computational resources usable to solve a set of computational fluid dynamics equations;

b) solving said set of computational fluid dynamics equations to determine an
15 approximation of fluid dynamics within the laboratory safety enclosure;

c) displaying a representation of said approximation of fluid dynamics within the laboratory safety enclosure;

d) adjusting said computational model that numerically represents the structure of the air deflector to further reduce turbulence represented by the display of said fluid
20 dynamics approximation; and

e) repeating steps b) through d) until a desired reduction in turbulence is displayed.

18. The method of claim 17, wherein said set of computational fluid dynamics equations are Navier-Stokes equations.

19. The method of claim 17, wherein said computational model represents an air deflector.

5 20. The method of claim 17, wherein said computational model represents a fume hood enclosure.

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